

REMARKS

Claims 39-40, 42 and 49-61 stand rejected under 35 U.S.C. §112, First Paragraph, for lack of an enabling description in the specification. Claims 1-13 and 25-61 stand rejected as obvious over U.S. Patent No. 6,143,666 to Lin et al. in view of U.S. Patent No. 6,352,594 to Cook et al., 2002 IEEE/SEMI Advanced Semiconductor Manufacturing Conference article by Ekbundit et al., IEEE Transactions on Semiconductor Manufacturing, vol. 12, no. 3, 340, article by Lee et al., and U.S. Patent No. 5,098,865 to Machado et al. In the present amendment, claims 1, 2, 7-9, 39, 43, 48 and 50 have been amended to improve clarity. No new matter has been added. After entry of this amendment, the pending claims are: 1-13 and 25-61.

35 U.S.C. §112, First Paragraph Rejection

The Examiner has rejected claims 39-40, 42 and 49-61 under 35 U.S.C. §112, First Paragraph, for lack of an enabling description in the specification.

Claim 39 has been amended to disclose maintaining a temperature difference within a range such that the film has a film thickness uniformity of less than or equal to 10%. Accordingly, the perimeter temperature cannot be “maintained at **any** temperature.” Rather, the temperature difference between the perimeter and inside areas is limited by a requirement that the film thickness uniformity be less than or equal to 10%. Such a limitation is fully supported at least by: the specification at paragraph 11, lines 10-11; page 11, Table 1; and page 15, Table 2; and original claims 1, 21 and 22.

Claims 40, 42 and 49-61 depend from claim 39, and therefore include the same restrictions on the temperature difference as claim 39. For these reasons, Applicants respectfully request that the rejection of claims under 35 U.S.C. §112, First Paragraph, be withdrawn.

35 U.S.C. §103 Rejections

The Examiner has rejected claims 1-13 and 25-61 under 35 U.S.C. §103(a) as being unpatentable over the combined teachings of Lin, Cook, Ekbundit, Lee and Machado (hereinafter collectively referred to as “the cited prior art”). Applicants respectfully traverse this rejection.

The obviousness rejection is based on five cited references that each mention that temperature is a factor in controlling film thickness uniformity. Citing to In re Aller, 220

F.2d 454, 456 (CCPA 1955), the Examiner reasons that, from the relationship disclosed in the cited prior art, it would have been obvious to one of ordinary skill to make and perform the claimed invention. Respectfully, Applicants disagree with the Examiner's characterization of the claimed invention and his application of Aller to the facts of the present application.

First, Aller is based on a specific set of facts, and it is important to keep these facts in mind when applying Aller. An illustrative claim from the patent application at issue in Aller reads:

Process for decomposing isopropyl benzene hydroperoxide and the production thereby of phenol and acetone which comprises bringing said peroxides into intimate contact with aqueous sulphuric acid of a concentration between 25 and 70% at temperatures between 40° and 80°. Aller at 455.

The art used to invalidate this claim in Aller discloses the exact same process as that recited in the above claim, except that the only experiment discussed in the reference article was conducted with aqueous sulphuric acid of a concentration of 10% and at a temperature of 100°C. *Id.* Thus, Aller applies to a case in which the same chemical reaction is claimed in the application and described in the prior art reference, and the only difference lies in the acid concentration and the temperature. As such, in Aller the only difference between the claimed chemical process and the prior art was a matter of *degree*. Thus, Aller is limited to those cases in which all of the elements of the pending claims are in the prior art and the only difference between the pending claims and the prior art lies in differences in the ranges of parameters within the prior art. Aller does not apply when there is any “difference in *kind*”, in contrast to a mere difference in *degree*, between the claimed process and the reference process. Aller only applies to those cases where, but for a change in a parameter range, each and every element of the claims is taught by the prior art.

The facts of Aller are completely different from those in the present application. First, the cited prior art in the present office action simply notes that temperature is a factor in controlling film thickness uniformity. While several of the cited references mention specific temperatures and/or temperature ranges, none teaches or suggests **controlling a temperature of at least two distinct locations on the substrate**, as required by claim 1. In contrast to the Examiner's characterization of the present invention as “ensuring that the surface temperature is uniform throughout the substrate,” the claimed invention requires a specific method of temperature control of at least two distinct locations on the substrate surface including an inner area and a perimeter area. In fact, as disclosed in the specification of the present application at paragraph 53, Applicants have determined that controlling the peripheral area

of a substrate to have a higher temperature than the inner area of the substrate results in a more uniform film thickness than setting a uniform temperature across the substrate. Thus, the Examiner has mischaracterized a basic teaching of the present application.

Thus, in complete contrast to Aller, the present application is not merely a change or optimization of ranges, but rather a method that is new and different in *kind* from anything disclosed in the cited references. The present application is simply not a case where the same basic process is disclosed in both the claims and the prior art. In the present application, the claimed invention does not just make a change to temperature, it is a new and different process of temperature control all together. Aller cannot be applied to a situation where the elements of the claimed invention are not taught in the prior art first, because Aller does not overcome the primary requirement that the prior art teach or suggest each and every element of the claims. Aller only applies once that primary burden is met, when the only difference between the claims and the prior art is in the ranges or parameters disclosed in the prior art. As detailed further below, none of the cited references teach or suggest the claimed element of controlling temperature at two distinct locations on the substrate. Thus, the foundation has not been laid for the application of Aller in the present office action.

Therefore, we must return to the primary burden on the Examiner to factually support a *prima facie* conclusion of obviousness under Section 2141 of the M.P.E.P. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations (*See, e.g.*, Section 2143.03 of the M.P.E.P.).

Not one of the five cited references teaches or suggests any method of controlling temperature at two distinct locations on the substrate. This element is simply not described, explicitly or inherently, in any single cited reference or in any combination of cited references. Rather, each teaches a different and distinct method or apparatus for controlling film deposition. As correctly noted by the Examiner in Paragraph 9 of the Office Action mailed November 6, 2002, Lin does not teach a method of controlling the temperature of the perimeter and inside surface of a substrate within the claimed temperature ranges. Cook, Ekbundit, Lee and Machado do not fill this gap in Lin. None of these five references, individually or in combination, teaches the method of claim 1 for controlling the temperature

of at least two distinct locations on a substrate including a perimeter area of the substrate surface and an inner area of the substrate surface.

To support a conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). Respectfully, the Examiner has not met this burden – all elements of claim 1 are not taught by Lin in view of Cook, Ekbundit, Lee and Machado.

Furthermore, simply noting that temperature affects film thickness does not inherently lead to the method of claim 1. As noted in Section 2112 of the M.P.E.P., to establish inherency, the evidence must make clear that the missing descriptive matter is “necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (Emphasis added). The Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic “necessarily flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

The method of claim 1 does not necessarily flow from a realization that film thickness is related to temperature. The argument in the present office action jumps from a relationship between temperature and film thickness to a method for controlling temperature at two distinct locations on a substrate. No evidence or technical support is provided for the Examiner’s conclusion. Applicants respectfully submit that controlling temperature at two distinct locations on a substrate is not necessarily present in the references’ general acknowledgment that temperature affects film thickness.

Additionally, there is no motivation to combine the five references in rejecting claims 1-13 and 25-61. The teaching or suggestion to make the claimed combination must be found in the prior art, and not based on applicant’s disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Each of the five cited references takes a separate and distinct approach to controlling film deposition, and none suggests combining with any of the other references. Applicants note that the Examiner has not stated in the present Office Action a motivation to combine the five references. The motivation to combine stated in the previous Office Action was based in part on a sixth reference which has since been disqualified as a prior art reference.

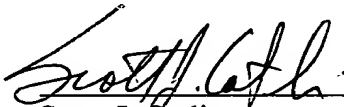
For the above reasons, claim 1 is patentable over the cited art. Claims 2-13 and 25-38 ultimately depend from claim 1. Thus, claims 2-13 and 25-38 are patentable over the cited art for at least the same reasons that claim 1 is patentable over the cited art. Further, independent claim 39 includes language similar to that relied on above in distinguishing claim 1 from the cited references. As such, claim 39 is patentable for the same reasons as claim 1. In addition, claims 40-61 ultimately depend from claim 39, and therefore claims 40-61 are patentable for at least the same reasons as claim 39. For these reasons, Applicants respectfully request that the 35 U.S.C. §103 rejection, as it is applied to claims 1-13 and 25-61, be withdrawn.

In view of the foregoing, Applicants believe that all of the claims are now in condition for allowance and respectfully request the Examiner to pass the subject application to issue. If for any reason the Examiner believes any of the claims are not in condition for allowance, he is encouraged to phone the undersigned at (650) 849-7777 so that any remaining issues may be resolved.

No fee is believed due for filing this response. However, if a fee is due, please charge such fee to Pennie & Edmonds LLP's Deposit Account No. 16-1150.

Respectfully submitted,

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